Mitsubishi General-Purpose Programmable Controller Renewal Tool

Conversion Adapter
Model
ERNT-ASQT68TD-H01
ERNT-ASQT68TD-H02

User's Manual

50CM-D180124-C(1409)

MITSUBISHI ELECTRIC ENGINEERING COMPANY LIMITED
HEAD OFFICE:Hulic KUDAN BLDG.1-13-5, KUDANKITA CHIYODA-KU, TOKYO 102-0073, JAPAN
NAGOYA ENGINEERING OFFICE:139 SHIMOYASHIKICHO-SHIMOYASHIKI, KASUGAI, AICHI 486-0906, JAPAN

● SAFETY PRECAUTIONS ●

(Always read these precautions prior to use.)

Before using this product, please read this manual carefully and pay full attention to safety to ensure that the product is used correctly.
The precautions presented in this manual are concerned with this product only. For Programmable Controller system safety precautions, refer to the user's manual of the MELSEC-Q series CPU module to be used.
In this manual, the safety precautions are ranked as "WARNING" and "CAUTION."

⚠WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or minor injury and/or property damage.

Note that failure to observe the ⚠ CAUTION level instructions may lead to a serious consequence according to the circumstances. Always follow the precautions of both levels because they are important to personal safety.
Please keep this manual in an easy-to-access location for future reference, and be sure to provide the manual to the end user.

[Precautions before using]

⚠ CAUTION

- When making a switch from the MELSEC-AnS Series to the MELSEC-Q Series, be sure to consult user's manual supplied with individual module under the MELSEC-Q Series to confirm differences in various aspects including performance, function, CPU input/output signals and buffer memory addresses between the two series.

[Installation Precautions]

⚠ CAUTION

- Use the Conversion Adapter in the environmental conditions that are specified in the general specification. If the Products are used in any environment beyond the bounds of the general specification, electric shock, fire, malfunction, or damage to or degradation of the Products will result.
- Do not directly touch any conductive parts of Conversion Adapter. Contact will cause malfunction or failure in the system.
- Fasten the Conversion Adapter securely with retaining screws, and tighten the screws by applying torque within specified limits. Loose screws can lead to the dropping of the Conversion Adapter, possibly causing breakage thereof. Excessive tightness of the screws can lead to breakage of the screws, Conversion Adapter or MELSEC-Q Series Module, possibly causing the dropping, shorting, and malfunction thereof.
- Always check for correct match between MELSEC-Q Series and the Conversion Adapter. Incorrect match can cause damage to the MELSEC-Q Series Module.
- When installing the Conversion Adapter, take care not to get your hand snagged on the Mounting Bracket or the like. Injury may result.

[Wiring Precautions]

⚠ WARNING

- Before attempting to install the Unit or carry out the necessary wiring, make certain that the external power supply, used in the system, is shut off on all three phases. Failure to do so may result in electric shock or damage to the product.
- When energizing the Products or putting them into operation after the completion of installation or wiring work, always have a cover placed over the terminal block. Without the cover placed in position, electric shock can result.

[Wiring Precautions]

⚠ CAUTION

- Carry out wiring for the Conversion Adapter correctly after checking the specification and terminal arrangement for the module used. Connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure.
- Tighten the MELSEC-AnS Series terminal installation screws and terminal screw securely by applying torque within the specified limits. Loose screws will cause short circuit, fire or malfunction. Excessive tightening will damage the screws or the Conversion Adapter which in turn will cause dropping of parts, short circuit or malfunction.
- Use care to prevent foreign materials including cuttings and wiring debris from entering the Conversion Adapter or the MELSEC-Q Series Module. These will be cause for fire, failure or malfunction.

[Startup and Maintenance Precautions]

⚠ WARNING

- Do not touch live terminals. There is a danger of electric shock or malfunction.
- Shut off the external power supply for the system in all phases before cleaning or retightening the terminal screws. Failure to do so may result in electric shock or cause the MELSEC-Q Series module to fail or malfunction. Loose screws can lead to dropping, shorting, and malfunction. Excessive tightness of the screws can lead to breakage of the screws, Conversion Adapter, or MELSEC-Q Series Module, possibly causing the dropping, shorting, and malfunction thereof.

⚠ CAUTION

- Do not modify the Conversion Adapter or take it apart. Doing so will cause failure, malfunction, personal injury, or fire.
- Do not drop the Conversion Adapter or do not give a strong impact to it. This will cause damage.

[Disposal Precautions]

⚠ CAUTION

- When disposing of the product, treat it as industrial waste.

EMC AND LOW VOLTAGE DIRECTIVES

Compliance to the EMC Directive, which is one of the EU Directives, has been a legal obligation for the products sold in European countries since 1996 as well as the Low Voltage Directive since 1997.
Manufacturers who recognize their products are compliant to the EMC and Low Voltage Directives are required to declare that print a "CE mark" on their products.

Authorized representative in Europe

Authorized representative in Europe is shown below.
Name: Mitsubishi Electric Europe BV
Address: Gothaer Strasse 8, 40880 Ratingen, Germany

1. Overview

This manual provides information about the Conversion Adapter "ERNT-ASQT68TD-H01, ERNT-ASQT68TD-H02" available as Renewal Tools for the Mitsubishi General-Purpose Programmable Controller.
The Conversion Adapter is a product for effecting conversion to transcend difference in pin assignment between the MELSEC-AnS Series and the MELSEC-Q Series.
Before attempting to make a switch from MELSEC-AnS Series to MELSEC-Q Series in your installation, consult the user's manual supplied with individual module under the latter series to learn about how they differ in various aspects including performance and function.

Once you have opened the packaging, verify that it contains the following products.

Product	Quantity
Conversion Adapter	1
Fixture installation screw (M3×8)	1
Terminal block cover	1

2. General Specifications

Item	Specifications					
Operating ambient temperature	0 to 55℃(Maximum surrounding air temperature 55℃)					
Storage ambient temperature	-25 to 75℃					
Operating ambient humidity	5 to 95%RH, non-condensing					
Storage ambient humidity						
Vibration resistance	Compliant with JIS B 3502 and IEC 61131-2		Frequency	Constant acceleration	Half amplitude	Sweep count
		Under intermittent vibration	5 to 8.4Hz	—	3.5mm	10 times each in X, Y, Z directions
			8.4 to 150Hz	9.8m/s²	—	
		Under continuous vibration	5 to 8.4Hz	—	1.75mm	—
			8.4 to 150Hz	4.9m/s²	—	
Shock resistance	Compliant with JIS B 3502 and IEC 61131-2 (147 m/s², 3 times each in 3 directions X, Y, Z)					
Operating atmosphere	No corrosive gases					
Operating altitude *1	0 to 2000m					
Installation location	Inside a control panel					
Overvoltage category *2	II or less					
Pollution degree *3	2					

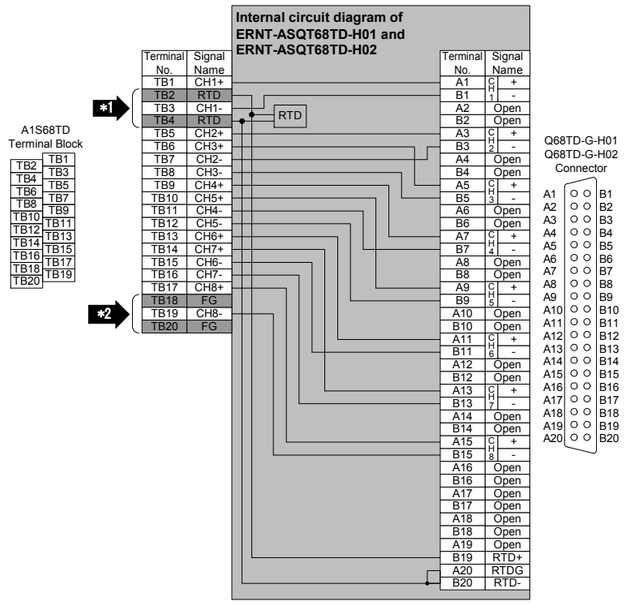
*1 : Do not use or store under pressure higher than the atmospheric pressure of altitude 0m.
*2 : This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises.
Category II applies to equipment for which electrical power is supplied from fixed facilities.
*3 : This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used.
Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

3. Product Specifications

For detail specifications which do not appear in the specification comparison charts contained herein, see the user's manual supplied with the MELSEC-Q Series module you use. Those parts of the specification that differ between the MELSEC-AnS Series and the MELSEC-Q Series are where a switch from the first series to the second is subjected to specification-related restrictions. Check the specification of the devices to be connected for more details.
Furthermore, it is recommended to refer to the "Transition from MELSEC-AnS/QnAS (Small Type) Series to Q Series Handbook (Intelligent Function Modules): L (NA)-08220ENG" issued by Mitsubishi Electric.

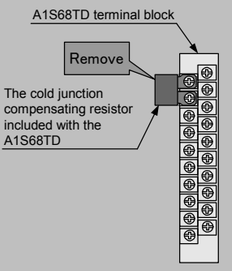
Conversion Adapter Model	MELSEC-AnS Series Model	No. of channels	MELSEC-Q Series Model	Conversion Adapter Weight (g)
ERNT-ASQT68TD-H01	A1S68TD	8 channels	Q68TD-G-H01	100
ERNT-ASQT68TD-H02			Q68TD-G-H02	110

Internal circuit diagram of ERNT-ASQT68TD-H01 and ERNT-ASQT68TD-H02


A1S68TD Terminal Block
TB1 TB2 TB3 TB4 TB5 TB6 TB7 TB8 TB9 TB10 TB11 TB12 TB13 TB14 TB15 TB16 TB17 TB18 TB19 TB20
*1
*2
RTD
Terminal No. / Signal Name
TB1 CH1+
TB2 RTD
TB3 CH1-
TB4 RTD
TB5 CH2+
TB6 CH3+
TB7 CH2-
TB8 CH3-
TB9 CH4+
TB10 CH5+
TB11 CH4-
TB12 CH5-
TB13 CH6+
TB14 CH7+
TB15 CH6-
TB16 CH7-
TB17 CH8+
TB18 FG
TB19 CH8-
TB20 FG
Terminal No. / Signal Name
A1 CH1 + B1 -
A2 Open B2 Open
A3 CH2 + B3 -
A4 Open B4 Open
A5 CH3 + B5 -
A6 Open B6 Open
A7 CH4 + B7 -
A8 Open B8 Open
A9 CH5 + B9 -
A10 Open B10 Open
A11 CH6 + B11 -
A12 Open B12 Open
A13 CH7 + B13 -
A14 Open B14 Open
A15 CH8 + B15 -
A16 Open B16 Open
A17 Open B17 Open
A18 Open B18 Open
A19 Open B19 RTD+
A20 RTDG B20 RTD-
Q68TD-G-H01
Q68TD-G-H02
Connector
A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19 A20
B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12 B13 B14 B15 B16 B17 B18 B19 B20

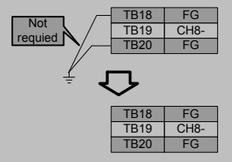
Precautions for wiring

*1 A cold junction compensating resistor (RTD) is built in the Conversion Adapter; therefore, always remove the cold junction compensating resistor (RTD) connected to the A1S68TD terminal block (TB2, TB4).



The temperature cannot be correctly measured with the wiring connected.

*2 Wiring to connect the FG terminals (TB18 and TB20) on the A1S68TD is not required because there is no FG terminals on the Q68TD-G-H01 and Q68TD-G-H02 side. Note, however, that leaving the FG terminal connected will not cause a problem because the wire is not connected inside of the Conversion Adapter.



< Specification comparison >

Specification \ Model		MELSEC-AnS Series	MELSEC-Q Series	
		A1S68TD	Q68TD-G-H02	Q68TD-G-H01
Temperature sensor input		0 to 1700℃	-270 to 1820℃	
Output	Temperature conversion value	16-bit signed binary (0 to 17000 : Value to the first decimal place ×10)	16-bit signed binary (-2700 to 18200 : Value to the first decimal place ×10)	
	Scaling value	16-bit signed binary (0 to 2000)	16-bit signed binary	
Thermocouple compliance standards		JIS C1602-1981	JIS C1602-1995, IEC 60584-1(1995), IEC 60584-2(1982)	
Applicable thermocouple and conversion accuracy		Refer to the table on the back		
Cold junction compensation accuracy		±1.0℃		
Overall accuracy		(conversion accuracy) + (temperature characteristic) × (operating ambient temperature variation) + (cold junction compensation accuracy)		
Resolution		B,R,S : 0.3℃ K,E,J,T : 0.1℃	B,R,S,N : 0.3℃ K,E,J,T : 0.1℃	
Conversion speed		400ms/8 channels	640ms/8 channels	320ms/8 channels
Number of analog input points		8 channels + cold junction compensation channel / module		
Disconnection detection		Available	Available (each channel respectively)	Not available (*1)
Isolation method	Between thermocouple input channel and programmable controller power supply	Transfer isolation		
	Between thermocouple input channels	Transfer isolation		
	Between cold junction compensation channel and programmable controller power supply	No isolation		
Number of I/O occupied points		32 points	16 points	
Wiring connection system		20 point terminal block	40-pin connector	
Internal current consumption (5VDC)		0.32A	0.65A	0.49A

*1 : Q68TD-G-H01 has the line disconnection monitoring function.

Make sure the [ ] section of the above table meets the specification of the machines and equipment connected to the MELSEC-Q Series module.

Precautions for the program

1. A1S68TD and Q68TD-G-H02/Q68TD-G-H01 differ from each other in the way input/output signals (X, Y) and buffer memory addresses are allocated. Therefore, you need make necessary changes to the sequence program that is used.
2. Q68TD-G-H01 has a greater conversion speed as compared with A1S68TD. This can make it possible for Q68TD-G-H01 to pick up noise, which A1S68TD would not, as an analog signal. In such case, eliminate the effects of noise by using the average processing function that is provided.
3. Set the thermocouple type using the intelligent function module switch setting in the Q68TD-G-H01 and Q68TD-G-H02 instead of DIP switches that are used in the A1S68TD.

POINT

When an error occurs in the measured temperature, the error can be corrected using the offset/gain setting in the Q68TD-G-H01 and Q68TD-G-H02.

< Specification comparison (continued) >
Applicable thermocouple and conversion accuracy

Thermo-couple type	A1S68TD			Q68TD-G-H02 Q68TD-G-H01			
	Measured temperature range	Conversion accuracy (At operating ambient temperature 25±5℃)	Temperature characteristic (Per operating ambient temperature variation of 1℃)	Measured temperature range *2	Conversion accuracy (At operating ambient temperature 25±5℃)	Temperature characteristic (Per operating ambient temperature variation of 1℃)	Max. temperature error at ambient temperature 55℃
B	–	–	–	0 to 600℃	*3	*3	*3
				600 to 800℃	±3.0℃	±0.4℃	±13.0℃
	800 to 1700℃	±2.5℃	±0.4℃	800 to 1700℃	±2.5℃		±12.5℃
	–	–	–	1700 to 1820℃	*3	*3	*3
R	–	–	–	-50 to 0℃	*3	*3	*3
				0 to 300℃	±2.5℃	±0.4℃	±12.5℃
	300 to 1600℃	±2℃	±0.3℃	300 to 1600℃	±2.0℃	±0.3℃	±9.5℃
	–	–	–	1600 to 1760℃	*3	*3	*3
S	–	–	–	-50 to 0℃	*3	*3	*3
				0 to 300℃	±2.5℃	±0.4℃	±12.5℃
	300 to 1600℃	±2℃	±0.3℃	300 to 1600℃	±2.0℃	±0.3℃	±9.5℃
	–	–	–	1600 to 1760℃	*3	*3	*3
K	–	–	–	-270 to -200℃	*3	*3	*3
				-200 to 0℃	Larger value of ±0.5℃ and ±0.5% of measured temperature	Larger value of ±0.06℃ and ±0.2% of measured temperature	±11.0℃
	0 to 1200℃	Larger value of ±0.5℃ and ±0.25% of measured temperature	Larger value of ±0.07℃ and ±0.02% of measured temperature	0 to 1200℃	Larger value of ±0.5℃ and ±0.25% of measured temperature	Larger value of ±0.06℃ and ±0.02% of measured temperature	±9.0℃
	–	–	–	1200 to 1370℃	*3	*3	*3
E	–	–	–	-270 to -200℃	*3	*3	*3
				-200 to 0℃	Larger value of ±0.5℃ and ±0.5% of measured temperature	Larger value of ±0.06℃ and ±0.15% of measured temperature	±8.5℃
	0 to 800℃	Larger value of ±0.5℃ and ±0.25% of measured temperature	Larger value of ±0.07℃ and ±0.02% of measured temperature	0 to 900℃	Larger value of ±0.5℃ and ±0.25% of measured temperature	Larger value of ±0.06℃ and ±0.02% of measured temperature	±6.75℃
	–	–	–	900 to 1000℃	*3	*3	*3
J	–	–	–	-210 to -40℃	*3	*3	*3
	0 to 750℃	Larger value of ±0.5℃ and ±0.25% of measured temperature	Larger value of ±0.07℃ and ±0.02% of measured temperature	-40 to 750℃	Larger value of ±0.5℃ and ±0.25% of measured temperature	Larger value of ±0.06℃ and ±0.02% of measured temperature	±5.625℃
	–	–	–	750 to 1200℃	*3	*3	*3
T	–	–	–	-270 to -200℃	*3	*3	*3
				-200 to 0℃	Larger value of ±0.5℃ and ±0.5% of measured temperature	Larger value of ±0.06℃ and ±0.1% of measured temperature	±6.0℃
	0 to 350℃	Larger value of ±0.5℃ and ±0.25% of measured temperature	Larger value of ±0.07℃ and ±0.02% of measured temperature	0 to 350℃	Larger value of ±0.5℃ and ±0.25% of measured temperature	Larger value of ±0.06℃ and ±0.02% of measured temperature	±2.625℃
	–	–	–	350 to 400℃	*3	*3	*3
N	Unavailable			-270 to -200℃	*3	*3	*3
				-200 to 0℃	Larger value of ±0.5℃ and ±0.5% of measured temperature	Larger value of ±0.06℃ and ±0.2% of measured temperature	±11.0℃
				0 to 1250℃	Larger value of ±0.5℃ and ±0.25% of measured temperature	Larger value of ±0.06℃ and ±0.02% of measured temperature	±9.375℃
				1250 to 1300℃	*3	*3	*3

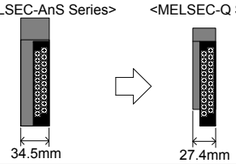
*2 If a value entered from the thermocouple is outside the measured temperature range given in the table, it is handled as the maximum/minimum value of the measured temperature range.
*3 Temperature measurement can be executed, but accuracy is guaranteed.

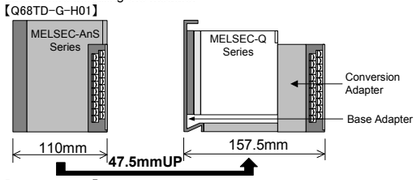
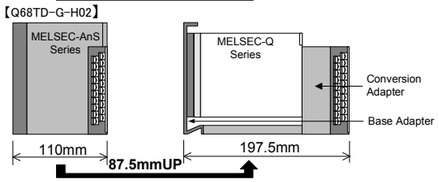
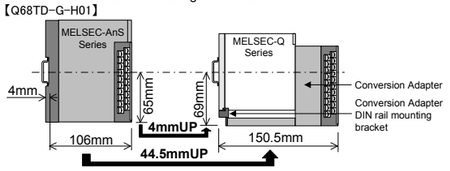
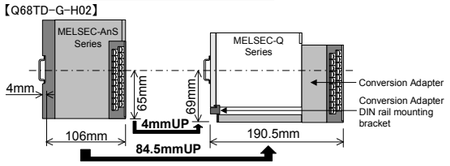
4. Mounting and Installation

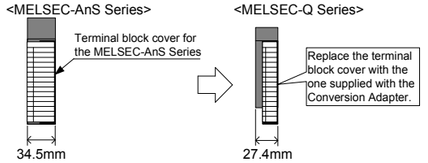
4.1 Handling Precautions

(1) Before attempting to install the Unit or carry out the necessary wiring, make certain that the external power supply, used in the system, is shut off on all three phases. Failure to do so may result in electric shock or damage to the product.
(2) Do not touch live terminals. There is a danger of electric shock or malfunction.
(3) Do not modify the Conversion Adapter or take it apart. Doing so will cause failure, malfunction, personal injury, or fire.
(4) Do not touch the energized part of the Conversion Adapter directly. Contact will cause malfunction or failure in the system.
(5) Fasten the Conversion Adapter, securely with retaining screws, and tighten the screws by applying torque within specified limits. Loose screws can lead to the dropping of the Conversion Adapter, possibly causing breakage thereof. Excessive tightness of the screws can lead to breakage of the screws, Converter Adapter, or MELSEC-Q Series Module, possibly causing the dropping, shorting, and malfunction thereof.
(6) Use care to prevent foreign materials including cuttings and wiring debris from entering the Conversion Adapter or the MELSEC-Q Series Module. These will be cause for fire, failure or malfunction.
(7) Do not drop the Conversion Adapter or do not give a strong impact to it. This will cause damage..

4.2 Use Precautions

Item	Use Precautions
Width dimension of module	Because the module is reduced in width dimension (34.5mm→27.4mm) and thus in area available for wiring, check dimensional data before installing the module. <MELSEC-AnS Series> <MELSEC-Q Series> 

Item	Use Precautions
Depth and Height dimension	Installation with the Base Adapter Because the module is increased in depth dimension, check dimensional data before installing the module. 【Q68TD-G-H01】  【Q68TD-G-H02】  Installation with the DIN rail Because the module is increased in depth and height dimension, check dimensional data before installing the module. 【Q68TD-G-H01】  【Q68TD-G-H02】 

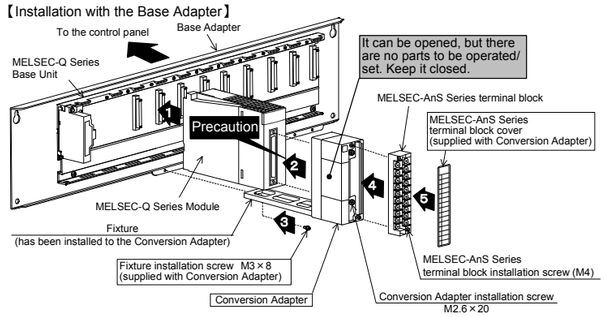
Item	Use Precautions
Terminal block cover	The terminal block cover for MELSEC-AnS Series is bigger than the width of the MELSEC-Q Series Module. Therefore, it is necessary to replace it with the terminal block cover supplied with the converter adapter. <MELSEC-AnS Series> <MELSEC-Q Series> 

4.3 Installation Environment

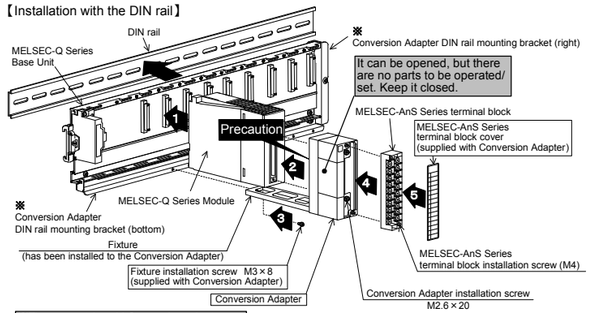
For details of the installation environment, refer to the user's manual of the MELSEC-Q series CPU module to be used.

5. Part Names and Installation Method

【Installation with the Base Adapter】



【Installation with the DIN rail】



※The separately-sold Conversion adapter DIN rail mounting bracket (ERNT-ASQDIN) is required to use this Conversion Adapter. Refer to the user's manual of the DIN rail mounting bracket of the Conversion Adapter for the installation method.

5.1 Installation Method

Installation with the Base Adapter	Installation with the DIN rail
Mount the MELSEC-Q Series Base Unit to the Base Adapter. Refer to the Base Adapter's manual for how to install them to the control panel.	Mount the MELSEC-Q Series Base Unit to the DIN rail mounting bracket of the Conversion Adapter and the adapters for DIN rail installation manufactured by Mitsubishi Electric. For how to mount them to the DIN rail, refer to the user's manual of the Conversion Adapter DIN rail mounting bracket and QCPU.

1 Mount the MELSEC-Q Series module to the MELSEC-Q Series Base Unit.
2 Install the Conversion Adapter to the MELSEC-Q Series module, and secure it with the Conversion Adapter installation screws (M2.6×20). (2 places)

Precaution
Before tightening the installation screws, check that the Conversion Adapter has been securely installed on the MELSEC-Q Series module. Tightening the screws in floating-off state or tilting state will damage the Conversion Adapter installation screws and the MELSEC-Q Series module.

3 Secure the fixture to the Base Adapter or Conversion Adapter DIN rail mounting bracket (bottom) of the Conversion Adapter with fixture installation screws (M3 x 8). (1 place)
4 Secure the MELSEC-AnS Series terminal block to the Conversion Adapter with the supplied terminal block installation screw (M4). (2 places, top and bottom.)
5 Remove the terminal block cover from the MELSEC-AnS Series terminal block and fit the terminal block cover supplied with the Conversion Adaptor in place.

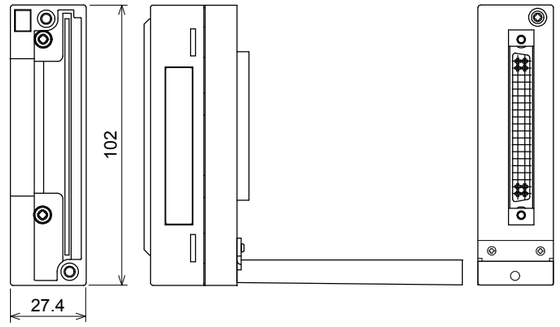
5.2 Tightening Torque

Tighten the module installation screws to the specified torque below. An inappropriate tightening torque could cause the product to fall or result in a short circuit, product failure or malfunction.

Screw Location	Tightening Torque Range
Conversion Adapter installation screw (M2.6×20)	0.20 to 0.29N·m
Fixture installation screw (M3×8)	0.61 to 0.82N·m
MELSEC-AnS Series terminal block installation screw (M4 screw)	0.78 to 1.18N·m

6. External Dimensions

Unit:mm



A	Model
82.1	ERNT-ASQT68TD-H01
122.1	ERNT-ASQT68TD-H02

Product Warranty Details

Please confirm the following product warranty details prior to product use.

Gratis Warranty Terms and Gratis Warranty Range

If any fault or defect (hereinafter referred to as "Failure") attributable to Mitsubishi Electric Engineering Company Limited (hereinafter referred to as "MEE") should occur within the gratis warranty period, MEE shall repair the product free of charge via the distributor from whom you made your purchase.

Gratis Warranty Period
The gratis warranty period of this product shall be one (1) year from the date of purchase or delivery to the designated place.
Note that after manufacture and shipment from MEE, the maximum distribution period shall be six (6) months, and the gratis warranty period after manufacturing shall be limited to eighteen (18) months.
In addition, the gratis warranty period for repaired products shall not exceed the gratis warranty period established prior to repair.

Gratis Warranty Range
The gratis warranty range shall be limited to normal use based on the usage conditions, methods and environment, etc., defined by the terms and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

Warranty Period after Discontinuation of Production

(1) MEE shall offer product repair services (fee applied) for seven (7) years after production of the product has been discontinued. Discontinuation of production shall be reported via distributors.
(2) Product supply (including spare parts) is not possible after production has been discontinued.

Exclusion of Opportunity Loss and Secondary Loss from Warranty Liability

Regardless of the gratis warranty period, MEE shall not be liable for compensation for damages arising from causes not attributable to MEE, opportunity losses or lost profits incurred by the user due to Failures of MEE products, damages or secondary damages arising from special circumstances, whether foreseen or unforeseen by MEE, compensation for accidents, compensation for damages to products other than MEE products, or compensation for other work carried out by the user.

Changes in Product Specifications

The specifications given in the catalogs, manuals and technical documents are subject to change without notice.

This document is a new publication, effective September 2014. Specifications are subject to change without notice.

Developed September 2014
50CM-D180124-C